Grinding, Lapping, Polishing, and Buffing Machine Tool Setters, Operators, and Tenders

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What They Do

Grinding, Lapping, Polishing, and Buffing Machine Tool Setters, Operators, and Tenders (Metal and Plastic) use a variety of machines to remove excess material or burrs from surfaces, sharpen edges and corners, and buff, hone, and polish metal or plastic workpieces. Workers and machines of this type are found in the automotive, aerospace, semiconductor, technical ceramics, metalworking, optics, and medical device industries.

In many manufactured products, metal and plastic parts must have precise flat and parallel surface finishes; these are the jobs of Grinding, Lapping, Polishing, and Buffing Machine workers. Machine workers operate a number of specialty machines such as honing or lapping machines. Honing is a tool that uses abrasives to give holes a fine surface finish. Lapping is a final finishing process that uses low-speed abrasion methods to remove very small amounts of material. Machine operators must often meet specification requirements to meet high tolerances of thousandths or even ten-thousandths of an inch. Tolerance is the variation allowed when maintaining a specific dimension for a machined part.

Machine operators grind, sharpen, or hone tools and products to required dimensions, using power tools, hand tools, and precision measuring instruments. They inspect or measure workpieces using measuring devices such as gauges or micrometers to conform to product specifications. Products made by these workers include power steering components, turbine engine parts, fuel pumps, engine components, compressors, and a variety of small metal parts, such as nuts, bolts, and screws.

Tasks

Grinding, Honing, Lapping, and Deburring Machine Set-up Operators

- Study blueprints, work order, or machining instructions to determine product dimensions, tooling, and to plan operational sequence.
- Compute machine indexing and settings for specified dimension and base reference points.
- Move machine controls to index workpiece and adjust machine for pre-selected operational settings.
- Select machine tooling to be used in machine operation, utilizing knowledge of machine and production requirements.
- Activate machine start-up switches to grind, lap, hone, debar, shear, or cut workpiece, according to specifications.
- Thread and hand feed materials through machine cutters or abraders.

EDD Employment Development Department State of California
LMID Labor Market Information Division "Your Information Source"

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- Mount and position tools in machine chuck, spindle, or other tool holding device to specifications, using hand tools.
- Observe and adjust machine operation.
- Repair or replace machine parts, using hand tools, or notify engineering personnel when corrective action is required.
- Maintain stock of machine parts and machining tools.

Buffing and Polishing Set-up Operators

- Read work order to determine parts to be buffed or polished.
- Set and adjust machine controls according to product specifications, utilizing knowledge of machine operation.
- Start and observe machine operation for conformance to specifications.
- Select buffing or polishing tools and position and mount tools to machine tool, chuck, or jig, using hand tools.
- Select and attach workpiece holding fixture to drive mechanism, and position or clamp workpiece to fixture.
- Hold stick of buffing compound or turn valve and depress pedal to administer coolant to workpiece surface.
- Remove workpiece and examine finish or luster to ensure surface meets specifications.
- Repair or replace machine parts to maintain machine in operational condition.

*Detailed descriptions of these occupations may be found in the Occupational Information Network (O*NET) at online.onetcenter.org.*

Important Skills, Knowledge, and Abilities

- Operation and Control — Controlling operations of equipment or systems.
- Equipment Selection — Determining the kind of tools and equipment needed to do a job.
- Mechanical — Knowledge of machines and tools, including their designs, uses, repair, and maintenance.
- Production and Processing — Knowledge of raw materials, production processes, quality control, costs, and other techniques for maximizing the effective manufacture and distribution of goods.
- Visualization — The ability to imagine how something will look after it is moved around or when its parts are moved or rearranged.
- Control Precision — The ability to quickly and repeatedly adjust the controls of a machine or a vehicle to exact positions.
- Arm-Hand Steadiness — The ability to keep your hand and arm stead while moving your arm or while holding your arm and hand in one position.
- Manual Dexterity — The ability to quickly move your hand, your hand together with your arm, or your two hands to grasp, manipulate, or assemble objects.

Grinding, Lapping, Polishing, and Buffing Machine Tool Setters, Operators, and Tenders

Work Environment

Most Grinding, Lapping, Polishing, and Buffing Machine Tool Setters, Operators, and Tenders work in areas that are clean, well lit, and well ventilated. They are on their feet much of the day and may do moderately heavy lifting. These workers operate powerful, high-speed machines that can be dangerous. However, risks are minimized if workers wear protective equipment, such as safety glasses and earplugs, to protect against flying particles of metal or plastic and against noise from the machines. Workers in the plastics industry who work near materials that emit dangerous fumes or dust must wear face masks or a breathing apparatus. Most machine operators work a 40-hour week. However, overtime is common during periods of increased production. Many shops operate more than one daily shift. Therefore, some machine operators may work nights and weekends.

Some machine operators may belong to a union, such as the International Association of Machinists and Aerospace Workers, depending on the industry and employer.

California's Job Outlook and Wages

The California Outlook and Wage table below represents the occupation across all industries.

Standard Occupational Classification	Estimated Number of Workers 2004	Estimated Number of Workers 2014	Average Annual Openings	2006 Wage Range (per hour)
Grinding, Lapping, Polishing Machine Tool Setters, Operators, and Tenders (Metal and Plastic)				
51-4033	10,800	10,500	210	$8.98 to $15.37

Wages do not include self-employment.
***Average annual openings** include new jobs plus net replacements.*
Source: www.labormarketinfo.edd.ca.gov, Employment Projections by Occupation and OES Employment & Wages by Occupation, Labor Market Information Division, Employment Development Department.

Trends

Employment of Grinding, Lapping, Polishing, and Buffing Machine Tool Setters, Operators, and Tenders is expected to decline slightly compared with all occupations over the 2004–2014 period. However, opportunities will continue to arise from the need to replace the machine operators who retire or leave the labor force for other reasons. Job growth will continue to be influenced by automation. In order to remain competitive with foreign manufacturers, many firms are using new technologies, such as computer-controlled machine tools and robots, to lower production costs. Labor-saving machinery tends to reduce the need for lower skilled machine operators because the tasks they perform are more easily automated. However, opportunities will continue to arise for those with experience on a wide variety of machines, and a good working knowledge of the properties of metals and plastics.

Training/Requirements/Apprenticeships

Grinding, Lapping, Polishing, and Buffing Machine Tool Setters, Operators, and Tenders usually follow one of the following training paths:

- Formal, four-year apprenticeship
- Extensive on-the-job training
- Vocational school

Some employers may offer formal training programs or apprenticeship opportunities. Also, industry associations offer voluntary certification through an exam process. The Institute for

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Metalworking Skills and the Society of Plastics Industry offer machine operator certification for their respective industries. Refer to *Other Sources of Information*.

Recommended High School Course Work
High school preparation courses in machine shop, blueprint reading, drafting, physics, algebra, geometry, language arts, and computer technology are helpful.

Where Do I Find the Job?

Direct application to employers remains one of the most effective job search methods. Candidates for training or apprenticeship programs should apply directly to employers who employ Grinding, Lapping, Polishing, and Buffing Machine Tool Setters, Operators, and Tenders. Unions representing workers also have information concerning apprenticeships and related matters.

Use the *Search for Employers by Industry* feature on the *Career Center* page at www.labormarketinfo.edd.ca.gov to locate employers in your area. Search under the following industry names to get a list of private firms and their addresses:

- All Other Motor Vehicle Parts Mfg.
- Aluminum Foundries (except Die-Casting)
- Bolts, Nuts, Screws, Rivets, and Washers
- Electroplating/Anodizing/Coloring Metal
- Gasoline Engines and Engine Parts
- Iron and Steel Mills
- Machine Shops
- Metal Coating and Nonprecious Engraving
- Metal Heat Treating
- Motor Vehicle Power Train Components
- Precision Turned Product
- Steel Foundries (except Investment)

Search these **yellow page** headings for listings of private firms:

- Grinding-Precision and Production
- Machine Shops
- Metal Castings
- Metal Fabricators
- Metal Rolling and Forming
- Metal Stamping
- Plastic Fabricators
- Plastics Molders, Rotational

Where Can the Job Lead?

Advancement opportunities for Grinding, Lapping, Polishing, and Buffing Machine Tool Setters, Operators, and Tenders generally takes the form of higher pay. However, there are some limited opportunities for workers to advance to multiple-machine operators or computer-control programmer or operator. Also, skilled Grinding, Lapping, Polishing, and Buffing Machine Tool Setters, Operators, and Tenders may advance to supervisory positions.

Other Sources of Information

International Association of Machinists and Aerospace Workers
www.iamaw.org

National Institute for Metalworking Skills
www.nims-skills.org

Precision Metalforming Association Educational Foundation
www.pmaef.org